



# General Design and Computation Sheet

JOB	Seismic Lateral Loads	DATE	3/16/00	SHEET	OF
WBS No.	1.6.5	COMPUTED	K. K. Chipley	CHECKED BY	

## Lateral Force on PC-2 Equipment due to Seismic Events

per 1997 Uniform Building Code, Section 1632 and using the site specific soil amplification as calculated by Joe Hunt.

- $h_r := 63.42\text{-ft}$  structure roof elevation wrt. grade
- $h_x := 0.0\text{-ft}$  elevation of equipment wrt grade, not less than 0, grade is assumed to be the 100.0 elevation on the Knight drawings (RTBT floor), TS instrument floor is actually at 96.92 ft or about -2.1 ft below grade
- $a_p := 1.0$  in-structure component amplification factor is 1.0 for equipment, varies between 1.0 and 2.5 per Table 16-O
- $C_a := .24$  ground level acceleration from DAC-ST-087000-A001 asumed to be 0.24 for PC-2 and 0.3 for PC-3. **This has changed from earlier.**
- $I_p := 1.5$  Importance factor is assumed to be 1.5 for PC-2 equipment from UBC (**This has changed from earlier.**), ? for PC-3
- $R_p := 3.0$  Component Response Modification Factor, from Table 16-O, and is 3.0 for most components
- $W_p := 1.0\text{-lb}$  weight of the component

$$F_p := \frac{(a_p \cdot C_a \cdot I_p)}{R_p} \left[ 1 + 3 \cdot \left( \frac{h_x}{h_r} \right) \right] \cdot W_p \quad (32-2) , \text{ pg 2-18}$$

$$F_p = 0.12 \text{ lb}$$



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However, the next equation in the UBC states that

$F_p$  shall be not less than  $0.7C_aI_pW_p$  or more than  $4C_aI_pW_p$

$$F_{pmin} := 0.7 \cdot C_a \cdot I_p \cdot W_p \quad (32-3)$$

therefore the minimum lateral force is

$$F_{pmin} = 0.252 \text{ lb}$$

and the height at which this minimum force is calculated by (32-2) is about

$$h_x := 23 \cdot \text{ft}$$

$$F_p := \frac{(a_p \cdot C_a \cdot I_p)}{R_p} \left[ 1 + 3 \cdot \left( \frac{h_x}{h_r} \right) \right] \cdot W_p$$

$$F_p = 0.251 \text{ lb}$$

at elevations less than this level the minimum calculation will control, and at elevations above this level the regular calculation will control.